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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/815,267

03/31/2004

Jos Bastiaens

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EXAMINER

ZEMEL, IRINA SOPJIA

ART UNIT

PAPER NUMBER

1796

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/815,267	<b>Applicant(s)</b> BASTIAENS ET AL.	
	<b>Examiner</b> Irina S. Zemel	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,9-11,16-18,22-24,28,30,31,35,37,38,44,52 and 53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 9-11, 16-18, 22-24, 28, 30-31, 35, 37-38, 44, and 52-53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 3, 9-11, 16-18, 22-24, 28, 30-31, 35, 37-38, 44, and 52-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weber in combination with Schmidt, Henn, Green and Taubitz, all of record.

The disclosure of all references have been discussed in detail in the previous office action, which discussions are incorporated herein by reference.

The newly added limitations reciting “consisting essentially of a single non-halogenated flame retardant in independent claims, and limiting this component to “consist of a pentane isomer or mixtures thereof” are still met by the disclosure of Weber. Specifically, as per numerous discussions before, all the claims, with the exception of claims 23, 24 and 28 are drawn to a product in the “product-by-process format”. While one of the process steps is limited to forming a mixture consisting essentially of a single blowing agent (or even consisting of a specific blowing agent as per dependent claims) and other recited components, addition of any number of additional blowing agent is not precluded at any different step, which will result in compositions having more than a single blowing agent (as per examples of Weber, for instance”, which still meets the claim limitations. In addition, the claim language “consisting of” limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed

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invention. *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976) (emphasis in original). In the instant case, the presence of additional blowing agent such as the one disclosed in Weber. Does not materially affect the novel characteristics of the claimed invention as it is still a non-halogenated flame retardant expanded (expandable) polystyrene/polyarylene ether blend exhibiting good flame retardant properties and expandability.

In the alternative, and specifically in relation to claim 28, elimination of an element and its function, i.e., elimination of the second blowing agent from the compositions of Weber would have been obvious when its function is not required or desired. Weber, expressly and at length, discusses the function of the second blowing agent and effects of its presence in the composition. See column 3, lines 27-41. Thus, when such effects are not required, elimination of the second blowing agent is clearly obvious and economically justified.

The claimed limitation of addition of nucleating agents was discussed in the previous office action, while addition of impact modifiers is met by Weber who expressly discloses desirability of use of high impact polystyrenes as the starting materials, which include polystyrenes impact modified with rubbers (in particulate state) as per disclosure in column 2, lines 46-52, and illustrative examples. Those impact modified polystyrenes inherently include impact modifiers (such as rubbers in particulate form), and, therefore, the final compositions also inherently include impact modifying rubbers (such as butadiene, isoprene or S/B rubbers).

The weight limitations of all respective components, such as the base resins and the flame retardants is also met by the disclosure of Weber, disclosing the amount of polystyrene as 20-94.9 %, amount of PPE of 01-75% and specifically disclosing addition of flame retardants in the amounts of up to 8 %, and also by disclosure of Taubitz teaching that conventional amount of flame retardants range up to 40 % of polyarylene based polymeric compositions.

The invention as claimed, is still considered to have been obvious from the combined teachings of the cited references.

### ***Response to Arguments***

Applicant's arguments filed 6-19-2008 have been fully considered but they are not persuasive. The applicants agree that the Weber reference discloses a composition comprising polystyrene, polyarylene ether and a blowing agent mixture, which composition may further include a flame retardant. The applicants argue that Weber does not disclose specific non-halogenated flame retardant as claimed in independent claim 1, 27, 37 and 52. The examiner agrees that Weber does not disclose specifically claimed phosphate based flame retardants, however, such retardants are known in the art as functional equivalents of the expressly disclosed phosphine and phosphate flame retardant of Weber (as per teachings of Taubitz) as discussed above. The applicants state that "Phosphines and phosphites are chemically different from phosphates. The chemical differences translate to different properties so a teaching regarding phosphines and phosphites would not suggest phosphates to one of ordinary skill in the art." The examiner never alleged that either phosphines or phosphites are chemically

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identical to the claimed phosphates. Clearly, these are three different classes of compounds having phosphorous in different valent states. However, each of those classes of compounds, i.e., either phosphines or phosphites or phosphates are known for their functional as flame retardants for polyarylene based compositions, and it is their functional equivalence (not chemical structure), that makes it obvious to use either one of them as flame retardant agent in compositions based on polystyrenes.

The applicants state that "Weber does not teach or suggest including an impact modifier in the composition as required by the both the claims to a flame retardant material (independent claims 1, 23, 37, and 52) and the "regular" material (independent claims 10, 17, 30 and 35)." This is not so. Weber uses high impact polystyrenes as the base components, which inherently contains impact modifiers. See discussion above.

The applicants further argue that "Weber requires the inclusion of an aromatic saturated hydrocarbon as part of the blowing agent. This teaching is in direct contrast to the dependent claims 9, 16, 22, 28, 35, and 44. These dependent claims only allow the use of pentane or pentane isomers as the blowing agent." This argument is addressed above in the body of the rejection.

The applicants further argue that "Schmidt has been cited for its teaching of flame retardants. Specifically, Schmidt teaches the use of an aromatic thermoplastic polyphosphonate as the flame retardant. Schmidt also teaches that triaryl phosphates can be included in the composition as a plasticizing compound (col. 6, lines 63-68) but it is important to not that these compounds are being included in amounts appropriate to a

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plasticizer, not a flame retardant. In fact, Schmidt teaches away from using triaryl phosphates as a flame retardant (see col. 7, lines 50 to 61). Furthermore Schmidt is not directed to an expanded or expandable composition so the insertion of the elements of Schmidt into an expanded or expandable composition is difficult to predict. Finally, Schmidt does not teach or suggest the inclusion of an impact modifier. In summary, Schmidt does not correct the deficiencies of the primary reference, Weber.”

First of all, Schmidt was used for teaching common molecular weight of PS, and no anything else, especially not addition of impact modifiers. Second, while Schmidts teaches addition of triaryl phosphates for different reasons, the amounts of those compounds are disclosed as up to 6 %, which overlaps with the claimed amounts, and does not teach away from the claimed amounts. And finally, certain functional additives (such as plasticizers and flame retardants) are expected to have similar effects (with known and predictable differences) in foamable and non-foamable compositions base on the same polymers. It is noted, however, that as discussed above, Scgmids reference was not used for teachings of specific flame retardants, Taubitz was.

The applicants further argue that “Henn discloses expandable polystyrene compositions. Henn has been cited for its disclosure with regard to polystyrene molecular weight.”

This is exactly the point. Henn does disclose suitability of the PS of claimed molecular weights fro use in expandable PS based composition. The applicants do not even argue that. All other arguments of whether there is sufficient or insufficient teaching to suggest the inclusion of an impact modifier in a poly(arylene ether)-

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polystyrene blend or whether or not Henn is silent with regard to flame retardants is irrelevant since those teaching were never relied upon in any of the rejections.

Similarly, the applicants arguments with regard to the disclosure of Green, i.e., that Green does not disclose addition of the flame retardants or impact modifier required by the amended claims etc., are simply irrelevant to the outstanding rejection which does not rely on such teaching with respect to the disclosure of Green,

The applicants further argue that Taubitz is directed to a molding composition, and not an expandable composition, which makes it difficult to apply the teachings of Taubitz to teachings of Weber. The examiner disagrees. As discussed above, functional additive, such as flame retardants, are expected to have similar effect (with known differences) whether used foamable molding or other polymer compositions based on the same polymer. These are non-reactive (towards the polymer and other major components) additives and their function remains the same with predictable effect in polymeric compositions.

The applicants further state that Taubitz discloses the inclusion of several elements which are outside the scope of the pending claims such as the phenol/aldehyde resin which is the key element of the composition (col. 3, lines 49-56). Regardless whether or not the additional elements of Taubitz are within or outside of the scope of the instant claims (which they are not for majority of the claims), it is noted the flame retardant function of the disclosed flame retardant agents remains in effect whether the compositions of Taubitz contain (illustrative examples) or lack the phenol/aldehyde resin mentioned by the applicants (comparative example). This, again,



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supports the examiners point that functional effectiveness of the flame retardants disclosed in Taubitz is expected to be similar for wide variety of different polystyrene based compositions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irina S. Zemel whose telephone number is (571)272-0577. The examiner can normally be reached on Monday-Friday 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571)272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Irina S. Zemel/  
Primary Examiner, Art Unit 1796

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